

ABSTRACT OF THE INVENTION

A handheld CZT radiation detector having a CZT gamma-ray sensor, a multichannel analyzer, a fuzzy-logic component, and a display component is disclosed. The CZT gamma-ray sensor may be a coplanar grid CZT gamma-ray sensor, which provides high-quality gamma-ray analysis at a wide range of operating temperatures. The multichannel analyzer categorizes pulses produce by the CZT gamma-ray sensor into channels (discrete energy levels), resulting in pulse height data. The fuzzy-logic component analyzes the pulse height data and produces a ranked listing of radioisotopes. The fuzzy-logic component is flexible and well-suited to in-field analysis of radioisotopes. The display component may be a personal data assistant, which provides a user-friendly method of interacting with the detector. In addition, the radiation detector may be equipped with a neutron sensor to provide an enhanced mechanism of sensing radioactive materials.

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